

**REMARKS**

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1, 2, 30, 32, 33, 39 and 40 are currently being amended.

This amendment changes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-30 and 32-45 are now pending in this application.

Claims 33-38 and 41-45 are allowed. Claims 7-10, 12-14, 16-17, 21, 25, 27 and 28 stand objected to as being dependent upon a rejected base claim but would be allowable if rewritten to include all the limitations of the base claim. Applicants appreciate the PTO's indication of allowable subject matter in this application.

Claims 1-6, 11, 15, 18-20, 22-24, 26, 29, 30, 32 and 40 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hsiung et al. (U.S. 4,175,572) and JP 58-023898 (hereafter JP'898). In view of the amendments and remarks herein, reconsideration is respectfully requested.

The present invention relates to compositions comprising one or more lipophilic solvents; one or more lipophobic plant nutrients and a mixture of one or more cationic emulsifiers, wherein the cationic emulsifier acts as a coupling agent between the lipophilic solvent and the lipophobic plant nutrient to form a homogeneous liquid composition. The present invention also relates to methods for using the same.

According to the PTO, Hsiung discloses a **hair treatment** composition comprising about 1 to 20% fatty alcohol, 0.05 to 20% quaternary polymer, from 1 to 20% mineral oil, and from 1 to 15% non-ionic emulsifier. The PTO acknowledges that Hsiung does not disclose or suggest a lipophobic plant nutrient, as claimed. In order to overcome this deficiency, the PTO

relies on JP '898 which also relates to a **hair treatment** composition which contains, among a myriad of adjuvants, from 0.7 to 7% ammonium chloride. From this, the PTO concludes that the claimed invention would have been obvious to the person having ordinary skill in the art because the compositions are "individually taught to be used to treat hair." Applicants respectfully disagree.

First, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success of the combination. Finally, the combination of references must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicants' disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Here, Applicants submit that the PTO has failed to establish a proper motivation for combining the cited references.

Second, the person having ordinary skill in the art would be a formulation chemist and such a chemist would apply the general principle of solubility that "like dissolves like". As a result, when considering a lipophobic substance such as inorganic ammonium salts, the person having ordinary skill in the art would consider using lipophobic solvents such as water. In fact, this is the solvent which is used in JP '898 which requires at least 50% water. Conversely, when considering using a lipophilic solvent such as a vegetable or mineral oil, the person having ordinary skill in the art would match this with a lipophilic plant nutrient. That is, the person having ordinary skill in the art would not consider combining a lipophobic substance such as inorganic formulation as claimed in the present application.

Finally, in further support of their position that the combination of references would not have rendered the pending claims, as amended, obvious, applicants submit herewith the Declaration of Peter W. Jones under 37 C.F.R. §1.132 (the "Jones Declaration") ✓

The Jones Declaration shows that when one combined example 1 from Hsiung with JP '898 that adding a lipophobic plant nutrient to a composition containing a significant quantity of lipophilic components is not a simple exercise and, in fact, results in unstable compositions where the lipophilic and lipophobic components separate into two phases. See, Jones Declaration at ¶¶ 17-20. The Jones Declaration also shows that when one combined example 2 from Hsiung with JP '898 that adding a lipophobic plant nutrient to a composition containing a significant quantity of lipophilic components results in unstable compositions. See, Jones Declaration at ¶¶ 21-24.

The Jones declaration thus demonstrates the result if a person skilled in the art attempted to combine the teachings of either Hsiung or Sapphukal with JP '898. In all instances, the resultant formulation was not a homogeneous liquid formulation but rather a two phase formulation. In one instance, the combination of ingredients led to the release of ammonia gas which removes the desired ammonium components of the lipophobic plant nutrient from the formulation. The person having ordinary skill in the art would consider these experiments a failure and would need to look elsewhere to be able to develop a homogeneous liquid formulation which contained both lipophilic solvents and lipophobic plant nutrients.

For at least the reasons stated above, Applicants respectfully submit that claims 1-6, 11, 15, 18-20, 22-24, 26, 29, 30, 32 and 40 are patentable over the prior art of record.

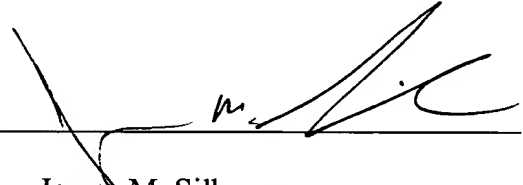
Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 30 June 2004

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By 

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Robert W. KILLICK et al.  
Title: Adjuvant Composition for Chemicals Used in Agriculture  
Appl. No.: 09/831,301  
Filing Date: 05/08/2001  
Examiner: A. Pryor  
Art Unit: 1616

**DECLARATION UNDER 37 C.F.R. § 1.132**

I, Peter William Jones, hereby declare and state that:

1. I am the Product Development Manager employed by Victorian Chemicals International Pty. Ltd. of 37-49 Appleton Street, Richmond, Victoria 3121, Australia.
2. I am one of the co-inventors of the invention described in the above-identified patent application entitled "Adjuvant Composition for Chemicals Used in Agriculture" which was given United States Serial No. 09/831,301, and accordingly I am familiar with the content of the present application.
3. The present invention as described in the above-captioned U.S. patent application relates to an adjuvant composition which comprises a lipophilic solvent, lipophobic plant nutrients (such as ammonium salts of inorganic anions) and cationic emulsifiers which is in the form of a ready-to-use homogenous liquid. The purpose of the adjuvant composition is primarily to increase the efficacy of herbicides although it is also useful for increasing the efficacy of other agrochemicals.
4. The present invention provides a comparatively stable homogeneous liquid composition which contains lipophobic components, being plant nutrients (inorganic ammonium salts) and a lipophilic component, being the lipophilic solvent, and cationic surfactant which acts as a coupling agent.
5. Plant nutrients such as inorganic ammonium salts are lipophobic, that is, more soluble in water than in oil. It is expected that such a lipophobic species would form a homogenous liquid when combined with a lipophobic solvent such as water. However, it is counter

intuitive to persons skilled in the art that such a lipophobic species could be formed into a homogenous composition with a lipophilic solvent such as vegetable oil.

6. To the best of my knowledge, there has been no disclosure of a homogenous liquid composition comprising a lipophobic plant nutrient (inorganic ammonium salts) and lipophilic solvent (such as those typically be used as an agricultural adjuvant) using cationic emulsifiers as a coupling agent prior to the filing of the above-captioned application.
7. I am aware that the U.S. Patent and Trademark Office has relied upon three prior art documents as the basis for rejecting the present invention as being obvious or lacking an inventive step.
8. To illustrate the non-obvious nature of the present invention, I have personally supervised the preparation of compositions from commercially available components based on the teaching in each of the three cited prior art documents. I have also personally supervised the stability testing of the prepared compositions.
9. The citation raised by the examiner in the recent Office Action is Hsiung. The examiner has noted that Hsiung discloses a composition containing lipophilic solvents and a cationic emulsifier as well as nonionic emulsifier, cosolvent and petrolatum. The examiner has correctly noted that Hsiung does not teach the use of inorganic ammonium salts. This is understandable since Hsiung teaches a combination of lipophilic components. A formulating chemist skilled in the art would expect that the addition of a lipophobic substance such as an inorganic ammonium salt to the composition would not be suitable to form a homogeneous composition.
10. The examiner has previously raised a similar citation Saphakkul which discloses a combination of a fatty alcohol, a cationic surfactant and two dyes. The examiner correctly noted that Saphakkul does not teach the use of inorganic ammonium salts. This is because Saphakkul discloses a carefully constructed disperse lamellar liquid crystal phase which is critical to that invention. A formulating chemist skilled in the art would recognise that the disperse lamellar liquid crystal phase is a careful balance of lipophilic elements in an aqueous phase. The formulating chemist would know that adding anything lipophobic such as an inorganic ammonium salt to the composition would most likely destroy the disperse lamellar liquid crystal phase and lead to a multi-phase composition.
11. The examiner has raised JP'898 as introducing the use of ammonium salts in hair compositions. JP'898 uses ammonium salts in an aqueous composition containing at least 50% water, surfactant, alcohol having 1-4 carbons and 1-3 OH groups and hydroxypropyl guar gum. The main components in this composition are lipophobic and this is why it is possible to use ammonium salts. A formulating chemist skilled in the art would not

consider adding a large quantity of lipophilic material to this composition if a single phase composition was desired.

12. The examiner has alleged that it would be obvious to take either Hsiung or Saphakkul and combine it with JP'898 to achieve the claimed invention. However, based on my experience as a formulation chemist, supported by the examples below, I respectfully disagree.
13. It is a well known fact that there are many known chemicals available. When preparing compositions, formulating chemists skilled in the art have a golden rule that "like dissolves like". So a lipophobic plant nutrient will like a lipophobic solvent such as water and will not like a lipophilic solvent such as a vegetable oil. In short, the known chemicals in the world cannot always be easily combined to form a homogeneous liquid composition. Inventiveness is often required to combine a selection of chemicals into a homogeneous liquid formulation.
14. The claimed invention in the above-captioned U.S. patent application is a homogeneous liquid composition comprising a lipophilic solvent, a lipophobic plant nutrient and a cationic emulsifier. The key feature of the invention is the capacity to form a homogeneous liquid composition containing a lipophilic solvent and a lipophobic plant nutrient. Normally, a composition having these two components would be expected to form a multi-phase composition - akin to an oil and vinegar salad dressing which has to be shaken before use. The individual components used in the formulation were known before the priority date but the claims are not to the individual components.
15. As discussed in the Background to the Invention part of the above-captioned US patent application, farmers have wanted a single homogeneous liquid formulation which included a lipophilic solvent and a lipophobic plant nutrient for some time. However, none of the agrochemical companies were able to provide such a product because it was difficult to produce a ready-to-use homogeneous liquid formulation that contained both a lipophilic solvent and a lipophobic plant nutrient. The invention of the above captioned U.S. patent application finally provides the farmers with the product that they want. The difficulty overcome was the ability to bring these known components together into a homogeneous composition.
16. In order to demonstrate that the combination of chemical components is complex, I arranged a series of experiments which adopt the examiner's suggested combination of either Hsiung or Saphakkul with JP'898.
17. Example 1 involved combining example 1 from Hsiung with JP'898. Table 1 of Exhibit 1 shows the formulation of four compositions based on the disclosure and teachings of Hsiung.

- Cetyl alcohol – a fatty alcohol (lipophilic solvent),

- Emulsifying Wax NF – a nonionic emulsifier,
  - Mineral Oil (lipophilic solvent). Our compositions contain Drakeol 9 which is a white mineral oil typical of mineral oils used in cosmetics and supplied by Penreco
  - Polydiallyldimethylammonium chloride a quaternary polymer (cationic polymer – not an emulsifier). Our compositions contain Genamin PDAC which is an aqueous solution of Polydiallyldimethylammonium chloride supplied by Clariant.
18. Composition 1 sets out the components of example 1 as described by Hsiung which is described by Hsiung as an aqueous dispersion for hair conditioning. I arranged for Composition 2 to be prepared using locally available components to match Composition 1. Composition 2 resulted in a stable formulation which I would describe as a semi-mobile cream/paste.
19. Compositions 3 and 4 involved adding ammonium chloride to Composition 2, that is, combining Hsiung and JP '898. When ammonium chloride was added to the Hsiung based Composition 2, the resultant Composition 3 was an unstable cream which separated into two layers, so that when left to stand at ambient for 24 hours, a clear colourless liquid phase of approximately 25% volume formed below the cream mixture. Similarly, Composition 4, when left to stand at ambient for 24 hours, formed a clear colourless bottom layer of about 40% volume.
20. It is evident from these simple examples that adding a lipophobic plant nutrient to a composition containing a significant quantity of lipophilic components is not a simple exercise and is likely to result in unstable compositions where the lipophilic and lipophobic components separate into two phases.
21. Example 2 involved combining example 2 from Hsiung with JP'898. Table 2 of Exhibit 2 shows the formulation of three compositions based on the disclosure and teachings of Hsiung.
- Sodium Hydroxide as either solid or as 46% solution,
  - Petrolatum or White Petroleum Jelly,
  - Mineral Oil (lipophilic solvent). Our compositions contain Drakeol 9 which is a white mineral oil typical of mineral oils used in cosmetics and supplied by Penreco.
  - Polyethylene (MW 1500) or Polyethylene glycol 1500 and Propylene Glycol which act as cosolvents.
  - Emulsifying Wax NF and Polyoxyethylene lanolin ether - nonionic emulsifiers



22. Composition 5 sets out the components of example 2 as described by Hsiung which is described by Hsiung as an aqueous dispersion for hair conditioning. I arranged for Composition 6 to be prepared using locally available components to match Composition 5. Composition 6 formed a stiff cream which was partly unstable and released a small proportion of a clear liquid phase when left overnight. The minor instability of this composition may be due to slight differences between the grade of components available to ourselves and Hsiung or it is also possible that the high alkalinity of the formulation ( $\text{pH} > 12$ ) associated with the sodium hydroxide cause hydrolysis of ester moieties in the nonionic surfactants.
23. Composition 7 involved adding ammonium chloride to Composition 6, that is, combining Hsiung and JP '898. The pH of Composition 6 was greater than 12 and adding the ammonium chloride to such an alkaline mixture immediately resulted in the release of a substantial amount of ammonia making composition 7 both dangerous and unstable. Composition 7 was clearly not a suitable combination of components for any hair conditioning or agricultural use. Similar ammonia evolution would be experienced if an ammonium salt were to be added to any of the other examples of Hsiung, each of which has  $\text{pH} > 12$  and a similar quantity of sodium hydroxide in the formulation.
24. These examples show that combining the compositions of Hsiung and JP 898 does not result in a composition which is stable.
25. Example 3 involved combining example 1 from Saphakkul with JP'898. Table 3 of Exhibit 3 shows the formulation of four compositions based on the disclosure and teachings of Saphakkul.
  - Cetyl trimethylammonium chloride (a cationic emulsifier) or Quatramine C16/29 which is 40% aqueous solution of same as supplied by APS Australia.
  - Cetostearyl alcohol, a lipophilic solvent
  - Coconut monoethanolamide, a nonionic surfactant
  - Paraffin Wax or Paraffin Wax 55J as supplied by Bentley-Chemplax
  - Various dyes, perfume, preservative and minor ingredients as described by Saphakkul
26. Composition 8 sets out the components of example 1 according to Saphakkul which is described to be a disperse lamellar liquid crystal phase. I arranged for Composition 9 to be prepared using locally available components to match Composition 8, but not including any of the dyes, perfume, preservative and minor ingredients as described by Saphakkul. Composition 9 can be described as a stable white viscous cream.
27. Compositions 10 and 11 involved adding ammonium chloride to Composition 9, that is, combining Saphakkul and JP '898. When ammonium chloride was added to Composition

9 the resultant Composition 10 was an unstable thin white cream which, when left to stand at ambient for 24 hours, formed a clear colourless liquid phase of approximately 50% volume below the cream mixture. Similarly, Composition 11 when left to stand at ambient for 24 hours formed a clear colourless bottom layer of about 50% volume.

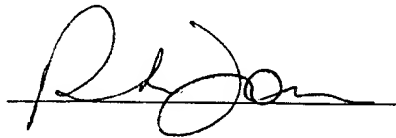
28. This example also shows that combining the compositions of Saphakkul and 'JP 898 does not result in a composition which is stable.
29. Example 4 involved combining compositions according to JP '898 (abstract only) with a lipophilic solvent as described by Hsiung or Saphakkul. Table 4 of Exhibit 4 shows the formulation of four compositions based on the disclosure and teachings of JP '898 (JP 58023898).
  - Hydroxypropyl Guar (Jaguar HP 60) as supplied by Rhodia.
  - Isopropyl alcohol
  - Glycerine
  - Sodium Lauryl Ether Sulphate 70%, an anionic surfactant
  - Sodium Lauryl Sulphate, an anionic surfactant
  - Ammonium Chloride
  - Mineral Oil (lipophilic solvent). Our compositions contain Drakeol 9 supplied by Penreco.
30. Compositions 12 and 14 set out the components according to the teachings of JP '898 which result in clear colourless mobile gels typical of shampoo compositions. The components used were either identified in the abstract for JP'898 or are components known to be typical of those used in shampoo compositions.
31. Composition 13 involved adding a lipophilic solvent (Drakeol 9, a mineral oil) to Composition 12. Composition 13 initially was a white emulsion but then rapidly separated into two phases, the upper phase (15%) was a white cream and the lower phase (85%) was a hazy viscous solution.
32. Composition 15 involved adding a lipophilic solvent (Drakeol 9, a mineral oil) to Composition 14. Composition 15 initially was a white emulsion which rapidly separated into two phases, the upper phase (20%) was a white cream and the lower phase (80%) was a hazy viscous solution.
33. This example further shows that combining the compositions of JP '898 with either Saphakkul or Hsiung does not result in a composition which is stable.
34. Even though there may be many examples in prior art where two of the components of our invention are used together and the third component may be used in another related example, combining all three components in a stable homogeneous form is not obvious.

The inherent instability associated with combining both lipophilic and lipophobic components in single composition would direct formulating chemists skilled in the art away from this combination.

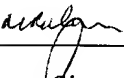
35. I hereby declare that all statements made herein of my own knowledge are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

15/6/04

Date



Peter William Jones

  
Witness Signature

Melissa Mogan pharmacist  
Witness Name & title

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**EXHIBIT 1**

Table 1 - Formulations for Compositions Prepared According to Teaching of the Cited Prior Art Document Hsiung (Example 1)

<b>Component</b>	<b>Composition 1</b>	<b>Composition 2</b>	<b>Composition 3</b>	<b>Composition 4</b>
	<b>(g)</b>	<b>(g)</b>	<b>(g)</b>	<b>(g)</b>
Cetyl Alcohol	10	10	10	10
Emulsifying Wax NF	7	7	7	7
Mineral Oil	5	-	-	-
Drakeol 9	-	5	5	5
Polydiallyldimethyl ammonium chloride	4	-	-	-
Genamin PDAC	-	10	10	10
Ammonium Chloride	-	-	3	7
Water	To 100	To 100	To 100	To 100

**EXHIBIT 2**

Table 2 - Formulations for Compositions Prepared According to Teaching of the Cited Prior Art Document Hsiung (Example 2)

<b>Component</b>	<b>Composition 5</b>	<b>Composition 6</b>	<b>Composition 7</b>
	<b>(g)</b>	<b>(g)</b>	<b>(g)</b>
Sodium Hydroxide	2.2	-	-
Sodium Hydroxide Solution 46%	-	4.8	4.8
Petrolatum	26	-	-
White Petroleum Jelly	-	26	26
Mineral Oil	9.5	-	-
Drakeol 9	-	9.5	9.5
Polyethylene (MW 1500)	1	-	-
Polyethylene glycol 1500	-	1	1
Emulsifying Wax NF	10	10	10
Propylene glycol	5.5	5.5	5.5
Polyoxyethylene lanolin ether	1	1	1
Ammonium Chloride	-	-	3
Water	To 100	To 100	To 100

**EXHIBIT 3**

Table 3 - Formulations for Compositions Prepared According to Teaching of the Cited Prior Art Document Saphakkul

<b>Component</b>	<b>Composition 8</b>	<b>Composition 9</b>	<b>Composition 10</b>	<b>Composition 11</b>
	<b>(g)</b>	<b>(g)</b>	<b>(g)</b>	<b>(g)</b>
Cetyl trimethyl ammonium chloride	1	-	-	-
Quatramine C16/29	-	3.45	3.45	3.45
Cetostearyl alcohol	2.75	2.75	2.75	2.75
Coconut Monoethanolamide	1	1	1	1
Paraffin Wax	1	-	-	-
Paraffin Wax 55J	-	1	1	1
Arionor Steel Blue	0.15	-	-	-
Arionor Mahogany	0.03	-	-	-
Fourrine BDN 100%	0.15	-	-	-
Celliton Violet 6B	0.2	-	-	-
Perfume	0.7	-	-	-
Preservatives	0.25	-	-	-
Minor Ingredients	2	-	-	-
Ammonium Chloride	-	-	3	7
Water	To 100	To 100	To 100	To 100

**EXHIBIT 4**

Table 4 - Formulations for Compositions Prepared According to Teaching of the Cited Prior Art Document JP 58023898

<b>Component</b>	<b>Composition 12</b>	<b>Composition 13</b>	<b>Composition 14</b>	<b>Composition 15</b>
	<b>(g)</b>	<b>(g)</b>	<b>(g)</b>	<b>(g)</b>
Hydroxypropyl Gaur (Jaguar HP60)	1.0	1.0	0.5	0.5
Isopropyl Alcohol	5.0	5.0	-	-
Glycerine	-	-	5.0	5.0
Sodium Lauryl Ether Sulphate 70%	20	20	20	20
Sodium Lauryl Sulphate	6	6	6	6
Ammonium Chloride	2	2	2	2
Mineral Oil, Drakeol 9	-	10	-	10
Water	To 100	To 100	To 100	To 100